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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/756,977	01/13/2004	Alan D. Kersey	CC-0700	3781

7590 01/13/2006

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EXAMINER	
LAU, TUNG S	

ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 01/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/756,977	KERSEY ET AL.
	Examiner	Art Unit
	Tung S. Lau	2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,11-21 and 27-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,11-15,17-21 and 27-44* is/are rejected.

7)☒ Claim(s) *16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *See office action*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/14/2005 has been entered.

Information Disclosure Statement

2. Information Disclosure Statement filed on 12/14/2005 and 06/01/2005 are acknowledged by the examiner; A copy of a signed PTO-1449 attached with this office action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

a. Claims 1, 11-15, 17, 19, 20, 28, 29, 30, 31, 32, 33, 34, 35, 36, 42, 21, 41, 43 and 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Fernald et al. (U.S. Patent Application Publication 2004/0168523).

Regarding claim 1:

Fernald discloses a method for measuring the flow velocity of a fluid flowing through a conduit, the method comprising: providing an array of at least two ultrasonic sensors disposed at predetermined locations along longitudinal direction of the conduit (fig. 12, unit 115, 116, 117, 118) each ultrasonic sensor providing a respective sensors signal indicative of a parameter of an ultrasonic signal propagation through the fluid (page 2, section 0012-0014, fig. 12, unit 12, 150); processing the sensor signals to define a convective ridge in the k-w plane (page 10, section 0124); and determining the slope of at least a portion of the convective ridge to determine the flow velocity of the fluid (page 10, section 0124, fig. 16).

Regarding claim 11:

Fernald discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least two ultrasonic sensors unit disposed at predetermined locations along the conduitalong a longitudinal direction of the conduit (fig. 12, section 115, 116); each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid; a processor that defines a convective ridge in the k-w plane in response to the sensor signals (page 10, section 0124), and determines the slope of at least a portion of the convective ridge to determine the flow velocity of the fluid (page 10, section 0124, fig. 16).

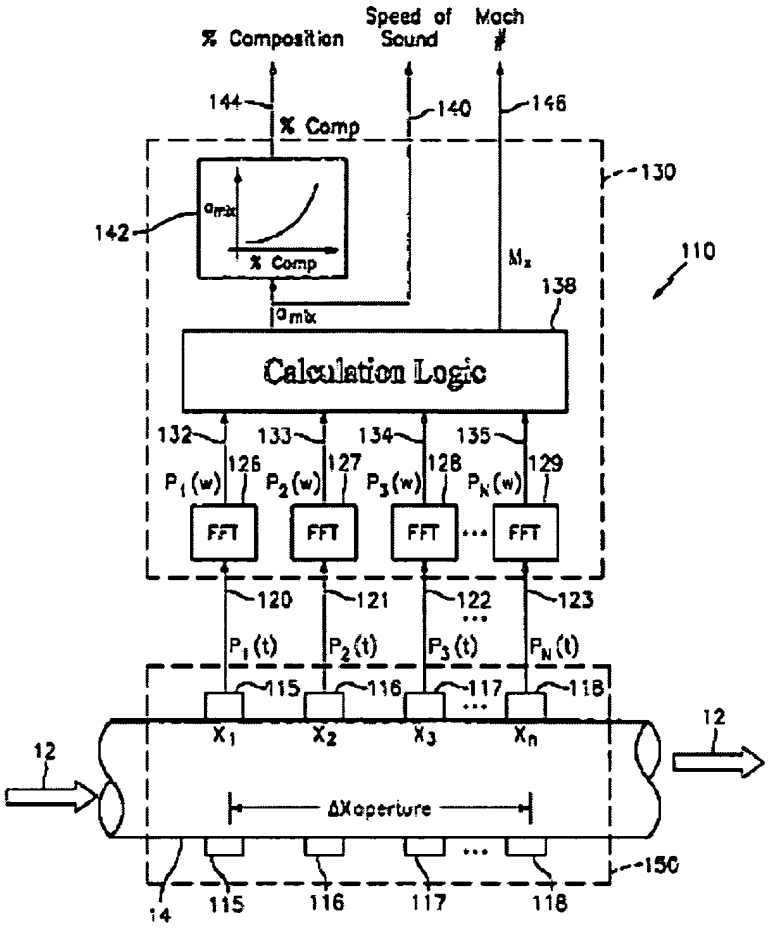

FIG. 12

Regarding claim 21:

Fernald discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least two ultrasonic sensors disposed at predetermined locations along the conduit along a longitudinal direction of the conduit (fig. 12, section 115, 116), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid (page 2, section 0012-0014); means for processing the sensor signals to define a convective ridge in the k-w

plane, and means for determining the slope of at least a portion of the convective ridge to determine the flow velocity of the fluid (page 10, section 0124, fig. 16).

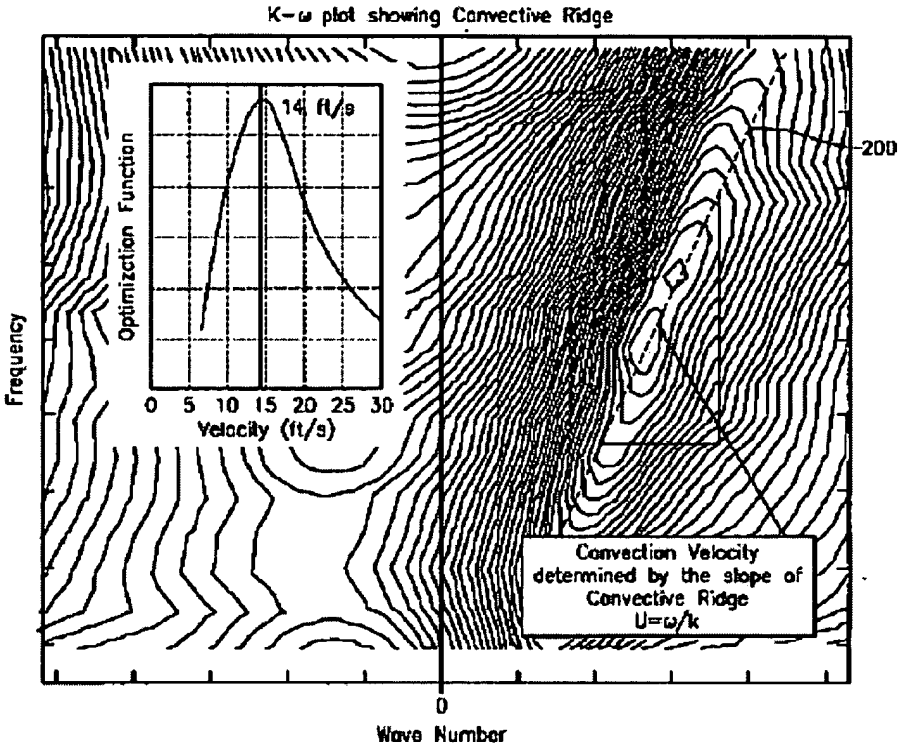

FIG. 16

Regarding claim 41:

Fernald discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least three ultrasonic sensors disposed longitudinally at predetermined locations along the conduit along a longitudinal direction of the conduit (fig. 12, section 115, 116), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid; and a processor (fig. 12, unit

138, page 2, section 0012-0014), in response to the sensor signals, that determines the flow velocity of the fluid (page 2, section 0012-0014).

Regarding claim 43:

Fernald discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least two ultrasonic sensors disposed longitudinally at predetermined locations along the conduit (fig. 12, section 115, 116), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid substantially orthogonal to the direction of the fluid flow (fig. 12, section 115, 116); and a processor (fig. 12, unit 138), in response to the sensor signals, that determines the flow velocity of the fluid (page 10, section 0124, fig. 16).

Regarding claim 44:

Fernald discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least two ultrasonic sensors disposed longitudinally at predetermined locations along the conduit (fig. 12, section 115, 116), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid; and a processor using an array processing algorithm to determine the flow velocity of the fluid (page 10, section 0124, fig. 16).

Regarding claim 12, Fernald further discloses the processor samples the

sensor signals over a predetermined time period, accumulates the sampled sensor signals over a predetermined sampling period, and processes the sampled sensor signals to define the convective ridge in the k-w plane (page 5, section 0064, page 10, section 0124); Regarding claim 13, Fernald further discloses the processor further determines the orientation of the convective ridge in the k-w plane (fig. 16, page 10, section 0124); Regarding claim 14, Fernald further discloses the sensor signals are indicative of vortical disturbances with the fluid (fig. 2); Regarding claim 15, Fernald further discloses the processor uses a beam forming algorithm to define the convective ridge in the k-w plane (fig. 16); Regarding claim 17, Fernald further discloses the processor determines the slope of at least a portion of the convective ridge by approximating the convective ridge as a straight line (fig. 16); Regarding claim 19, Fernald further discloses determines the volumetric of the flow (page 4, section 0059); Regarding claim 20, Fernald further discloses sensor signal is transmit time to prolong through the fluid (page 9, section 0117); Regarding claim 28, Fernald further discloses pulse-echo configuration (fig. 15, unit 180, 182); Regarding claim 29, Fernald further discloses at least 3 sensors (fig. 15, unit 180, 182, 184); Regarding claim 30, Fernald further discloses amplitude of the signal (fig. 16); Regarding claim 31, Fernald further discloses sensors are clamped onto an outer surface of the conduit (abstract); Regarding claim 32, Fernald further discloses sensors are attached to the conduit (abstract); Regarding claim 33, Fernald further discloses sensor are contact with fluid (abstract); Regarding claim 34,

Fernald further discloses fluid is single phase (abstract ,fig. 2); Regarding claim 35, Fernald further discloses fluid is multiphase (abstract ,fig. 2); Regarding claim 36, Fernald further discloses multiphase included liquid and gas (abstract); Regarding claim 42, Fernald further discloses the processor uses an array processing algorithm (fig. 12, unit 138).

b. Claims 41, 43 and 44 are rejected under 35 U.S.C. 102(e) as being anticipated by Lynnworth et al. (U.S. Patent Application Publication 2004/0011141).

Regarding claim 41:

Lynnworth discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least three ultrasonic sensors (fig. 2, unit 20, 22, 24, 30, 32, 34) disposed longitudinally at predetermined locations along the conduit along a longitudinal direction of the conduit (page 2, section 0021-0023), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid (page 2, section 0021-0023); and a processor (fig. 2, unit 62), in response to the sensor signals, that determines the flow velocity of the fluid (page 2, section 0021-0023, abstract).

Regarding claim 43:

Lynnworth discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least two ultrasonic sensors disposed longitudinally at predetermined locations along the

conduit (fig. 2, unit 20, 22, 24, 30, 32, 34, page 2, section 0021-0023), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid substantially orthogonal to the direction of the fluid flow (page 2, section 0021-0023); and a processor (fig. 2, unit 62), in response to the sensor signals, that determines the flow velocity of the fluid (page 2, section 0021-0023, abstract).

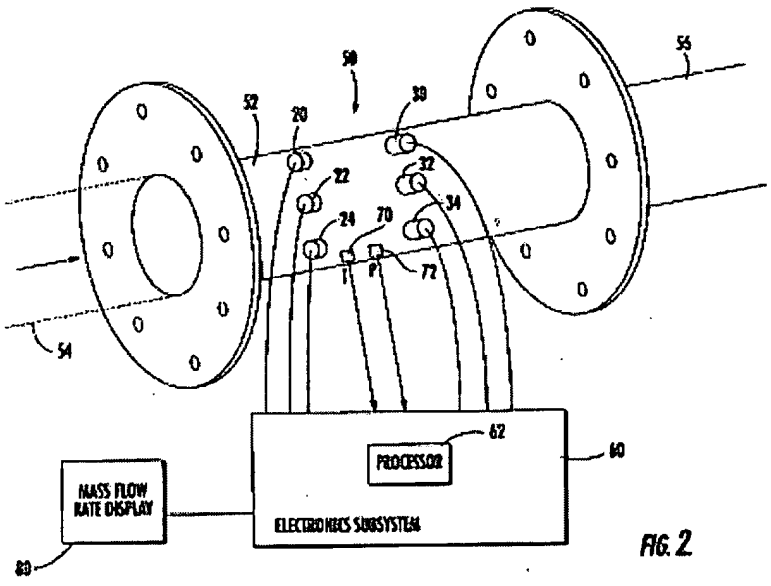

FIG. 2

Regarding claim 44:

Lynnworth discloses an apparatus for measuring the flow velocity of a fluid flowing through a conduit, the apparatus comprising: an array of at least two ultrasonic sensors disposed longitudinally at predetermined locations along the conduit (fig. 2, unit 20, 22, 24, 30, 32, 34, page 2, section 0021-0023), each ultrasonic sensor providing a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid (fig. 2, unit 20, 22, 24, 30, 32,

34, page 2, section 0021-0023); and a processor (fig. 2, unit 62) using an array processing algorithm to determine the flow velocity of the fluid (page 2, section 0021-0023).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

a. Claims 18, 37, 38, 27, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fernald et al. (U.S. Patent Application Publication 2004/0168523) in view of Lynnworth (U.S. Patent Application Publication 2004/0011141).

Regarding claim 18, Fernald further discloses each ultrasonic sensor includes an an ultrasonic receiver ' which are disposed such that the ultrasonic signal propagating there between is orthogonal to the direction of the fluid flow (page 3, section 0042, fig. 12, unit 115-118, abstract); Regarding claim 37, Fernald further discloses included receiver (page 3, unit 0034); Regarding claim 38, Fernald further discloses the ultrasonic receiver of each ultrasonic sensor are disposed opposing each other such that the ultrasonic signal propagates through the fluid substantially orthogonal to the direction of the fluid flow (fig. 12, unit 115, 116, 117, 118); Regarding claim 27, Fernald further discloses sensors are disposed in pitch-catch configuration and receiver are mounted opposing each other (fig. 12,

unit 115, 116); Regarding claim 39, Fernald further discloses each ultrasonic sensor includes an ultrasonic unit having an ultrasonic receiver (page 3, unit 0034, fig. 12, 115); Regarding claim 40, Fernald further discloses ultrasonic signal that propagates through the fluid substantially orthogonal to the direction of the fluid flow, which reflects back substantially orthogonal to the direction of the fluid flow to the receiver of each ultrasonic unit (fig. 12, unit 115, fig. 2, unit 12);

Fernald discloses not discloses the ultrasonic transmitter, Lynnworth discloses the ultrasonic transmitter (page 2, section 0021), in order to have a very accurate result (page 1, section 0009).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fernald to have the ultrasonic transmitter taught by Lynnworth, in order to have a very accurate result (page 1, section 0009).

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. I , 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Fernald and Lynnworth are analogous art because they are from the same field of endeavor, detecting mass flow rate in a conduit.

Allowable Subject Matter

5. Claim 16 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitation of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: prior art fail to teach the beam forming algorithm includes one of a Capon algorithm and a MUSIC algorithm.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

6. Applicant's arguments with respect to the amended claims have been considered but are moot in view of the new ground(s) of rejection. However, applicant's arguments filed 12/14/2005 have been fully considered but they are not persuasive.

A. Applicant argues that Lynnworth does not show the 'an array of at least three ultrasonic sensors disposed longitually at predetermined locations along the

conduit a longitudinal of the conduit'. Lynnworth discloses clearly 'an array of at least three ultrasonic sensors disposed longitually at predetermined locations along the conduit a longitudinal of the conduit' in page 2, section 0023, page 3, section 0042.

B. Applicant continues to argue that Lynnworth does not show the 'a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid orthogonal to the direction of the fluid'. Lynnworth discloses clearly 'a respective sensor signal indicative of a parameter of an ultrasonic signal propagating through the fluid orthogonal to the direction of the fluid' in page 2, section 0023, page 3, section 0042, fig. 2, unit 54.

B. Applicant continues to argue that Lynnworth does not show the 'a processor using array processing algorithm to determined the flow velocity of the fluid'. Lynnworth discloses clearly 'a processor using array processing algorithm to determined the flow velocity of the fluid' page 2, section 0023, page 3, section 0042.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung S Lau whose telephone number is 571-272-2274. The examiner can normally be reached on M-F 9-5:30. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on 571-272-2269. The fax phone numbers for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BRYAN BUI
PRIMARY EXAMINER

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